

2013 Aquatic Management Program - Spy Pond Arlington, MA

Report Prepared by: Aquatic Control Technology
11 John Road
Sutton, MA 01590



Report Prepared for: Town of Arlington
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In 2013 a non-native plant management program using Sonar (fluridone) herbicide and AquaPro (glyphosate) herbicide was conducted at Spy Pond to control growth of non-native, invasive Eurasian watermilfoil (*Myriophyllum spicatum*), herein referred to as milfoil, and common reed (*Phragmites australis*). The Year End Report for the 2013 Management Program follows. This report will serve to document the herbicide application process, the post-treatment monitoring of aquatic vegetation in the waterbody and the observed response of the targeted weeds. Attached to this report is supporting documentation that further help to explain the project and the observed results.

All work performed at Spy Pond in 2013 was conducted in accordance with the Order of Conditions (OOC) issued by the Arlington Conservation Commission (DEP #100-57) and the License to Apply Chemicals issued by the MA DEP – Office of Watershed Management (Lic #13157). Management plans were also reviewed by the MA Department of Fisheries and Wildlife and approved with conditions under the Natural Heritage and Endangered Species Program.

A chronology of this past year's management and brief description of events follows.

2013 Program Chronology:

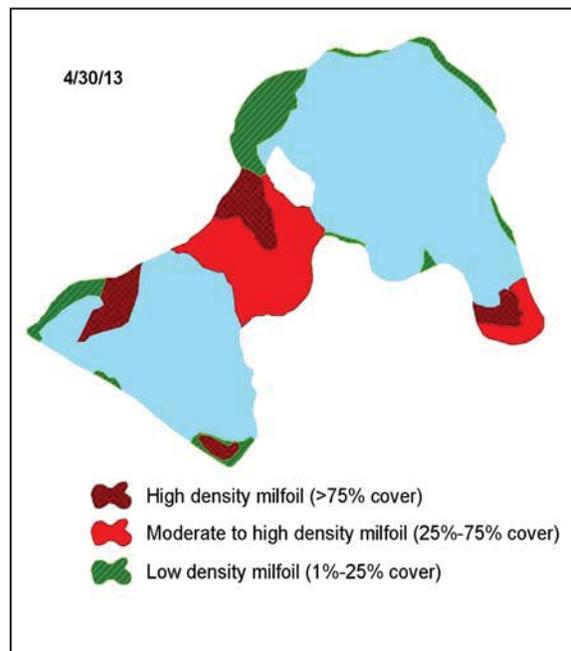
- DEP License to Apply Chemicals Issued5/20/13
- Early Season Vegetation Survey4/30/13
- Initial Sonar application5/21/13
- Collection of FasTEST immunoassay 6/6 & 7/31/13
- Follow-up "booster" application of Sonar6/28/13
- Post-Treatment Inspection.....7/31/13
- Late Season Survey 10/9/13
- Treatment of *Phragmites*.....10/9/13

Pre-treatment Survey:

A pre-treatment survey was conducted on April 30th to document vegetation composition and distribution and confirm active growth of milfoil. During the survey the entire littoral area of the waterbody was toured and the extent of the milfoil infestation was marked with GPS. The presence of other aquatic plant

species were also documented and general observations regarding distribution of species type, species density and species location were collected. An AquaVu underwater camera and plant collection with a throw-rake were used to assist in the identification of vegetation and the determination of the milfoil boundary. A temperature/dissolved oxygen profile was also collected along with a Secchi disk clarity measurement (results attached).

- The large littoral area of Spy Pond supported moderate to dense cover (40%-90%) of aquatic plants, primarily Eurasian watermilfoil, sago pondweed (*Stuckenia pectinatus*) and curlyleaf pondweed (*Potamogeton crispus*).
- Milfoil was actively growing but still immature with most plants between 2-3 feet tall.
- Low-density growth of curlyleaf pondweed was widespread throughout the pond. Where found curlyleaf pondweed was at or near the surface of the water.
- Sago pondweed growth was dense in the middle of the lake to the southwest of Elizabeth Island where it has historically been predominant. Pondweed growth did not appear to be active at the time of the survey and most of the observed biomass appeared to be from the previous year.
- Scattered occurrences of thin-leaf pondweed, coontail (*Ceratophyllum demersum*) (*Potamogeton pusillus*) and waterweed (*Elodea canadensis*) were also recorded.
- The substrate from the immediate shoreline to depths of ~3 feet is generally a mixture of sand and gravel and does not support dense growth of aquatic plant species.
- Water clarity was good with a Secchi disk reading of 9.5 feet.
- Water temperatures ranged widely between 17.2°C (~63°F) and 8.1°C (~47°F) at the surface and at 11 meters, respectively (average = 11.9 °C)
- Dissolved oxygen was good with an average concentration of 9.8 mg/L to 8 meters. (approximately 100% saturation)



Sonar (Fluridone) Treatment

The initial Sonar application at Spy Pond was scheduled for May 21st. Prior to treatment printed signs that warned of the temporary water use restrictions to be imposed following treatment were posted around the lake. Pre-treatment notifications were also submitted to a local newspaper(s) for publication and to the Arlington Conservation Commission.

An 18 foot airboat equipped with a low pressure pump and calibrated spraying system and a calibrated cyclone spreader was used for the treatment. Granular Sonar One herbicide was applied directly to areas of milfoil growth with the calibrated seed spreader. Liquid Sonar Genesis was applied subsurface using weighted hoses. Sonar Genesis was applied evenly to the North and South Basins. The initial application targeted a lake-wide treatment concentration of ~8ppb. GPS was used during the application to monitor boat speed and ensure a uniform distribution of the herbicide in each designated treatment area.

Weather during the treatment was optimal with an air temperature of approximately 65°F, 5-10 mph breeze from the west and partial cloud cover

A second “booster” application of Sonar was scheduled and performed on June 28th. Timing of the second application was guided by the collection of FastEST samples that were analyzed by the SePRO Laboratory (the manufacturer of Sonar). A second round of FastEST samples was collected on July 31st, however they were not shipped to the laboratory for analysis due to the advanced stage of milfoil decay observed during the inspection. Results from the July 6th collection round are attached.

All treatments were completed by Aquatic Control’s state certified applicators. Treatments were conducted in accordance with the product label directions and the permits issued by MA DEP and the Arlington Conservation Commission. Each application proceeded smoothly and at no time during the course of this management program did we either observe or receive any reports of negative affect of treatment on fish, other aquatic life or wildlife.

Plant Response to Fluridone Treatment:

At the time of the second Sonar application (6/28/13) milfoil in Spy Pond was showing signs of prolonged fluridone exposure with severely bleached tips (chlorosis) and slowed growth. By the time of our post-treatment inspection in late July (7/31/13) milfoil throughout Spy Pond had collapsed out of the water column and what little remained was decomposing on the bottom. Sago Pondweed remained abundant to the west of Elizabeth Island but was off the surface and appeared to have been impacted by the extended fluridone exposure. Stonewort (*Nitella* sp. - a plant-like marco algae) was also common and was found at low to moderate densities throughout the littoral zone of Spy Pond. Low density growth of coontail growth was also noted but most observed plants were exhibiting stress from fluridone exposure.

Late Season Survey:

A Late Season Vegetation Survey was performed on October 9th. The entire lake was toured and vegetation was identified and spatially referenced. Again an AquaVu underwater camera and plant collection with a throw-rake were used to assist in the identification of vegetation.

The post-treatment survey revealed that excellent control of milfoil had been attained throughout Spy Pond. Based on our inspection, we believe that milfoil biomass (i.e. measured as the weight/unit area or height of milfoil in the water column) was reduced by >99% as compared to conditions observed in the pre-treatment survey. Reduction in bottom coverage of milfoil post-treatment (i.e. stem density) was also believed to be greater than 99%. Actually, no milfoil was observed during the post treatment inspection or the late Season Survey.

- Plant distribution was consistent with what was recorded during the spring and was generally confined to depths of less than 10 feet.
- Post-treatment plant cover was scant but was dominated by sago pondweed and stonewort with scattered occurrences of coontail
- Thin-leaf pondweed and waterweed were also observed along the eastern shore in the North Basin.

- A thin layer of filamentous algae cover most of the observed plant cover.
- Water clarity remained relatively high with a Secchi disk reading of 8.9 feet.
- Water temperatures ranged between 16.6°C (~62°F) and 9.8°C (~49°F) at the surface and at 10 meters, respectively
- Dissolved oxygen remained good above the thermocline with an average concentration of 9.5 mg/L to 5 meters. (approximately 95% saturation)
- Dissolved oxygen below the thermocline was <1.0mg/L. This is typical of a thermally stratified lake.

Phragmites Management

Management of non-native, invasive *Phragmites* was continued in 2013. On October 9th all occurrences of *Phragmites* along the shoreline of Spy Pond were treated with AquaPro (glyphosate) herbicide. Only one small stand by the Elks Lodge on the northeastern shoreline was left untreated at the Club's request.

- Treatment was conducted using AquaPro (glyphosate) herbicide and a non-ionic surfactant (Agri-dex).
- Treatment was performed using a low-volume backpack sprayer
- Where feasible *Phragmites* stands were sprayed outward from shore to minimize any non-target impacts from mist or overspray.
- In total we estimate that approximately 3/4 acre was treated on 10/9/13. An estimated 75% of the targeted growth was abutting Kelwyn Manor Park and on the western shore of Elizabeth Island; only small isolated stands were found elsewhere along shore.

Recommendations for Ongoing Management

Following the whole-lake Sonar treatment performed at Spy Pond in 2013, it is not likely that management of milfoil will be needed for a few years. Typically 3 years of reasonable milfoil control has been achieved following Sonar treatments at Spy Pond. If milfoil growth does, however, begin to return in some of the more historically problematic areas we would recommend considering a limited spot-treatment with diquat (Reward) to maintain desirably low milfoil cover. Diquat has been used at Spy Pond on a number of occasions previously and has proven effective at providing excellent seasonal control of milfoil as well as coontail and sago pondweed, which have both been problematic at Spy Pond in the past.

Specifically for the 2014 season, we recommend the following invasive aquatic plant management efforts:

1. Early Season Vegetation Survey to assess milfoil growth and finalize 2014 treatment needs (if any).
2. (Contingency) Early season treatment with diquat (up to 15 acres) for the control of milfoil re-growth or nuisance growth of sago pondweed.
3. Treatment of *Phragmites* re-growth (as necessary) with glyphosate herbicide (late Aug-mid October)
4. Late Season Vegetation Survey to document year after treatment vegetation conditions and provide recommendations for continued management

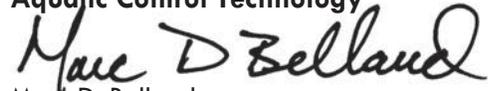
Based on the above tasks we would recommend a budget of \$2,000 for early and late season vegetation surveys in 2014. We would also recommend that the Town budget an additional \$7,500 for contingency treatment of nuisance milfoil, coontail or sago pondweed re-growth, if necessary.

We also reckoned an additional \$1,000 budget for follow-up spot-treatment of *Phragmites*.

We look forward to continuing our work with the Town of Arlington towards lake management goals. If you have any questions, please do not hesitate to contact us.

Sincerely,

Aquatic Control Technology



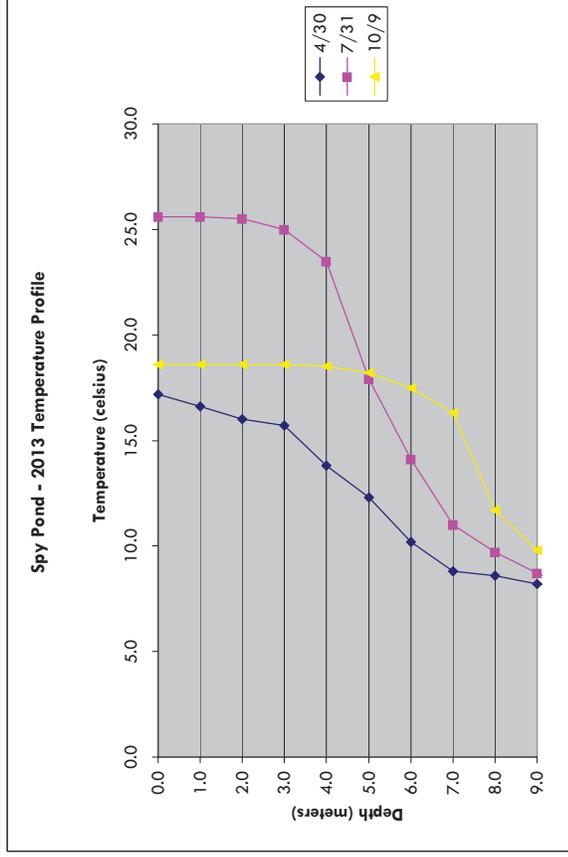
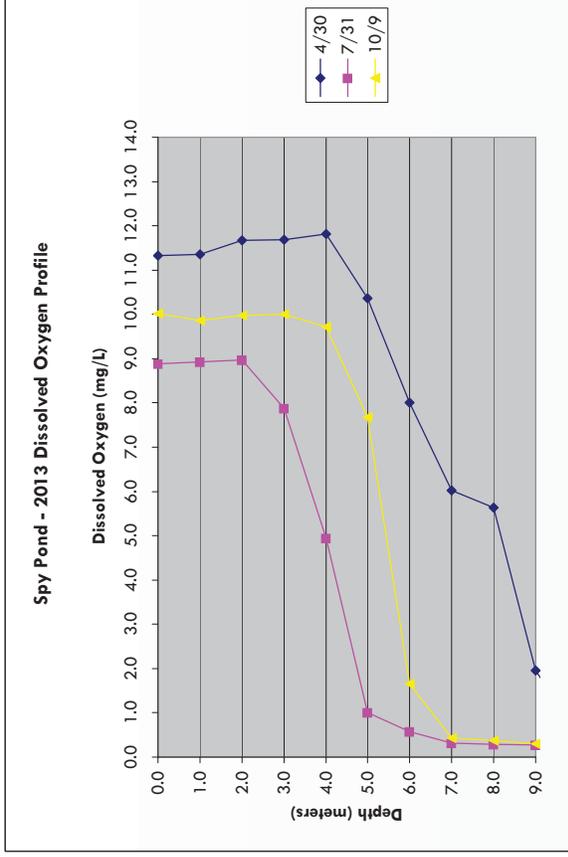
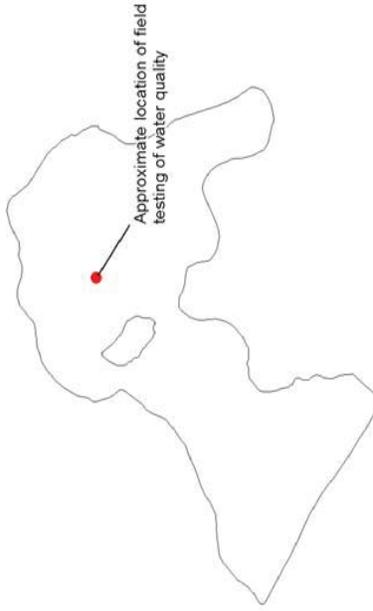
Marc D. Bellaud
President/Aquatic Biologist



Michael Lennon
Biologist

2013 Temperature/Dissolved Oxygen Profiles For Spy Pond - Arlington, MA

Depth (m)	4/30 Temp. (C)	4/30 D.O. (mg/l)	7/31 Temp. (C)	7/31 D.O. (mg/l)	10/9 Temp. (C)	10/9 D.O. (mg/l)
Surface	17.2	11.33	25.6	8.88	18.6	10.02
1.0	16.6	11.36	25.6	8.93	18.6	9.86
2.0	16.0	11.67	25.5	8.97	18.6	9.97
3.0	15.7	11.69	25.0	7.88	18.6	10.00
4.0	13.8	11.81	23.5	4.95	18.5	9.71
5.0	12.3	10.36	17.9	1.00	18.2	7.67
6.0	10.2	8.00	14.1	0.58	17.5	1.66
7.0	8.8	6.02	11.0	0.32	16.3	0.43
8.0	8.6	5.63	9.7	0.29	11.7	0.38
9.0	8.2	1.96	8.7	0.28	9.8	0.30
10.0	8.1	0.53	7.9	0.23	16.6	9.5





Customer Company

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Customer Contact

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Waterbody Information

Waterbody: Spy Pond - MA Waterbody Size (acres): 90.00 Depth Average: 0.0

Sample Information

Lab ID	Sample Location	Test Method	Results	Sampling Date	Sampling Time	Temp at Receipt (C)
24276	1	Sonar/Fluridone (µg/L)	8.6	06/06/2013		
24277	2	Sonar/Fluridone (µg/L)	6.0	06/06/2013		

ANALYSIS STATEMENTS:
SAMPLE RECEIPT /HOLDING TIMES: All samples arrived in an acceptable condition and were analyzed within prescribed holding times in accordance with the SRTC Laboratory Sample Receipt Policy unless otherwise noted in the report.
PRESERVATION: Samples requiring preservation were verified prior to sample analysis and any qualifiers will be noted in the report.
QA/QC CRITERIA: All analyses met method criteria, except as noted in the report with data qualifiers.
COMMENTS: No significant observations were made unless noted in the report.

Laboratory Information

Date Received: 06/18/2013	Sample Preparation Date: 06/18/2013
Time Received: 10:00	Date Analysis Performed: 06/19/2013
Date Results Sent: 06/19/2013	

Disclaimer: The results listed within this Laboratory Report relate only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a dry weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the exclusive use of SRTC Laboratory and its client. This report shall not be reproduced, except in full, without written permission from SRTC Laboratory. The Chain of Custody is included and is an essential component of this report.

This entire report was reviewed and approved for release.


Reviewed By: SRTC Laboratory Manager

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